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Two New Species of *Cordalia* Jacobs from the Eastern Palaearctic Region, with Redescriptions of Three Species (Coleoptera: Staphylinidae: Aleocharinae)

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With 16 figures

Summary

Five Eastern Palaearctic *Cordalia* species (Coleoptera: Staphylinidae: Aleocharinae: Falagriini) are (re-)described, illustrated, and distinguished from similar congeners: *C. vestita* (Boheman), *C. smetanai* Pace, *C. permutata* **n. sp.** (Nepal, China, Taiwan), *C. longicornis* Cameron, and *C. schawalleri* **n. sp.** (Nepal). The distribution of *C. permutata* is mapped.

Zusammenfassung

Fünf ostpaläarktische *Cordalia*-Arten (Coleoptera: Staphylinidae: Aleocharinae: Falagriini) werden beschrieben oder wiederbeschrieben und von ähnlichen Arten der Gattung unterschieden: *C. vestita* (Boheman), *C. smetanai* Pace, *C. permutata* **n. sp.** (Nepal, China, Taiwan), *C. longicornis* Cameron und *C. schawalleri* **n. sp.** (Nepal). Wesentliche Unterscheidungsmerkmale werden abgebildet. Für *C. permutata* wird eine Verbreitungskarte erstellt.

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1. Introduction

Excluding *C. obscura* (Gravenhorst), whose presence in "India" (Cameron 1939) has not been confirmed, eleven species of *Cordalia* Jacobs 1924 were previously

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known from the Eastern Palaearctic region, four of them from the Himalayas, six from China, and the widespread *C. vestita* (Boheman), which has been recorded from various Eastern Palaearctic and Oriental localities (ASSING 2001, CAMERON 1939, PACE 1991, 1992a, 1992b, 1993, 1998). The type material of *C. vestita* had not been revised, so that the prevailing interpretation of the species mainly rested on the original description and on the redescription of external characters in CAMERON (1939).

An examination of material of *Cordalia* recently made available to me by several colleagues not only contained two undescribed species, but also raised considerable doubt as to the correctness of the current concept of *C. vestita*, so that the type material of this species was revised, along with that of *C. smetanai* Pace and *C. longicornis* Cameron.

Abbreviations

The material referred to in this study is deposited in the following public and private collections.

BMNH The Natural History Museum, London (M. BRENDELL, S. SHUTE);
MHNG Muséum d'histoire naturelle de Genève (G. CUCCODORO);
NRMS Naturhistoriska Riksmuseet Stockholm (B. VIKLUND);
SMNS Staatliches Museum für Naturkunde, Stuttgart (K. WOLF-SCHWENNINGER, W. SCHAWALLER);
SMTD Staatliches Museum für Tierkunde Dresden (O. JÄGER);
cAss private collection V. ASSING, Hannover;
cHir private collection G. HIRTHE, Rostock;
cSch private collection M. SCHÜLKE, Berlin.

Acknowledgements

I am indebted to all the colleagues for the loan of material under their care.

2. Descriptions of species

2.1. *Cordalia vestita* (Boheman) (Figs. 1–3)

Falagria vestita Boheman (BOHEMAN 1858: 25).

Type material examined: Lectotype ♀, here designated, remounted [antennae missing, except for the basal 3 antennomeres]: "China / Kinb. / Type / *vestita* Bhm. / Typus / 7940, E91 + / Lectotypus ♀ *Falagria vestita* Boheman desig. V. ASSING 2001 / *Cordalia vestita* Boheman det. V. ASSING 2001" (NRMS).

Note: The original description is based on an unspecified number of syntypes. According to the curator in charge, the above specimen is the only type in the BOHEMAN collection (VIKLUND, pers. comm.). In order to secure the present interpretation by fixing a single name-bearing type, the specimen from the BOHEMAN collection is here designated as lectotype.

Redescription: Total length 2.6 mm. Body brown, with the head, abdominal tergite VI, and the anterior half of tergite VII infuscate; legs testaceous.

Head 1.10–1.15 times as wide as long (length measured from anterior margin of clypeus); posterior angles rounded, but relatively well-marked; eyes very large, temples only approximately half the length of eyes or slightly longer; integument without microsculpture and with extremely fine, barely noticeable punctation; pubes-

cence suberect. Antennae relatively slender; antennomere IV weakly oblong, V-VII approximately as wide as long, and VIII-X moderately transverse.

Pronotum 1.05–1.10 times as wide as long; posterior margin strongly convex; punctation very fine, much denser than that of head; pubescence relatively long and suberect to erect; median sulcus narrow and not very deep; posterior median area of pronotum somewhat flattened.

Elytra approximately 1.4 times as wide as pronotum and at suture only indistinctly shorter than pronotum; between anterior angles and scutellum with deep impressions, so that the anterior angles appear bulging and well-marked; punctation similar to that of pronotum; pubescence relatively long and suberect to erect. Scutellum impunctate. Hind wings fully developed. Tarsi relatively slender; metatarsi 0.80–0.85 times the length of metatibiae; first metatarsomere approximately as long as the three following tarsomeres.

Abdomen with dense and fine punctation, but punctures much more distinct than those of forebody; anterior transverse impressions of tergites III-V with 7 short carinae; tergite VII with palisade fringe; tergite VIII transverse and without median carina, fringes of dense thin pubescence not confined to posterior margin, but extensive and present also in posterior $^1/_4$ to $^1/_2$ of tergal surface (Fig. 3).

♀: Sternite VIII posteriorly weakly concave or truncate, and with relatively long and stout micropubescence; spermatheca as in Figs. 1–2.

Comparative notes and comments: I have seen no males of *C. vestita*. PACE (1993) gives an illustration of the aedeagus, but in view of the fact that at least some of the records of *C. vestita* are based on misidentifications, it is uncertain if it really refers to this species. From all the Palaearctic congeners I have studied, *C. vestita* is distinguished by the shape of the spermatheca and, except for *C. smetanai* (see below), especially by the extensive fringes of long thin pubescence on the abdominal tergite VIII. From the widespread *C. obscura* (Gravenhorst), it is additionally separated by the much finer punctation and the erect pubescence of the forebody.

Distribution: *C. vestita* has been reported from various localities in India, Burma, Assam, China, Vietnam, Thailand, and Indonesia (e. g. CAMERON 1939, PACE 1992a, 1992b, 1993), but these records may be based on an erroneous interpretation of this species. It is present in Nepal (examined record from Khandbari district), but at least some of the published records from Nepal (PACE 1985, 1987, 1991) are based on misidentifications and refer to an undescribed species (*C. permutata* n. sp.).

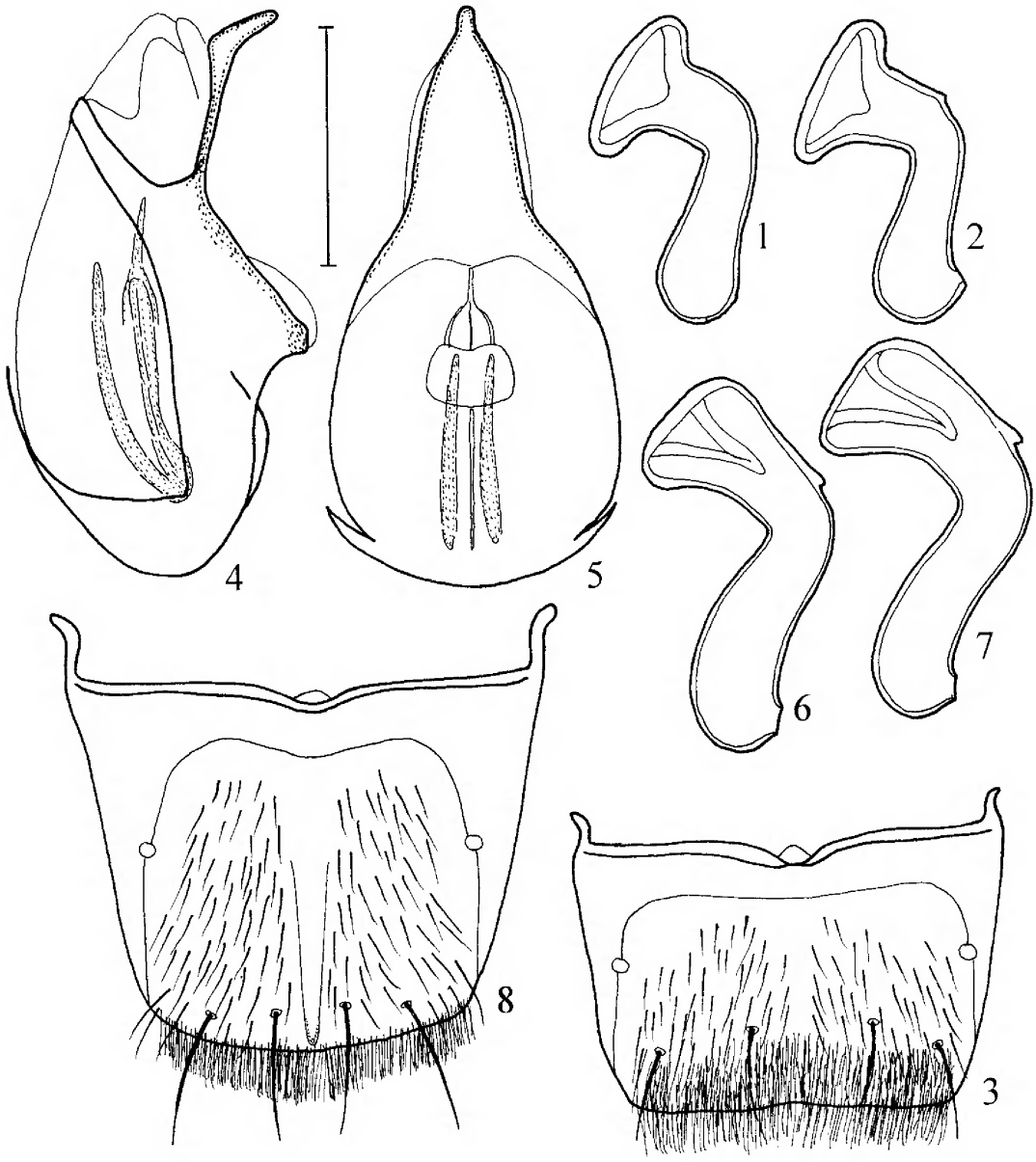
2.2. *Cordalia smetanai* Pace

Cordalia smetanai Pace (PACE 1991: 122).

Type material examined: Holotype ♂: "Nepal, Khandbari Distr. / For. [forest] above Ahale, 2400 m, 25.III.82, A. & Z. SMETANA / Holotypus *Cordalia smetanai* m. det. R. PACE 1986 / *Cordalia smetanai* sp. n. det. R. PACE 1986" (MHNG). – Paratypes: 6 ex., same data as holotype (MHNG).

Redescription: 1.9–2.2 mm. General appearance similar to *C. vestita*. Body almost uniformly brown, with abdominal tergite VI and the anterior half of tergite VII slightly infuscate, and with the legs, antennomeres I, II, III, XI, and the elytra slightly lighter.

Head without sexual dimorphism; 1.15–1.20 times as wide as long (length measured from anterior margin of clypeus), slightly wedge-shape, i. e. temples weakly



Figs. 1–8. *Cordalia vestita* (Boheman) (1–3) and *C. permutata* n. sp. (4–8). – 1–2. Spermathecae of lectotype (1) and of ♀ from Nepal (2); – 3. tergite VIII; – 4–5. median lobe of aedeagus in lateral and in ventral view; – 6–7. spermathecae of ♀♀ from Taiwan (6) and Nepal (7); – 8. tergite VIII. – Scale bar: 0.2 mm.

dilated posteriad (dorsal view); posterior angles rounded, but rather well-marked; eyes relatively small, temples usually slightly longer than eyes; integument without microsculpture and with extremely fine, barely noticeable punctation; pubescence almost erect. Antennae much shorter than in *C. vestita*; antennomere IV subquadrate, and V-X increasingly transverse, antennomere X three times as wide as long or nearly so.

Pronotum without sexual dimorphism; of similar shape as in *C. vestita*, but not flattened in posterior median area, with moderately convex posterior margin, with

more pronounced (i. e. wider, deeper, and relatively longer) median sulcus, and with more distinct and denser punctation.

Elytra at suture much shorter than pronotum; anterior angles rounded, almost obsolete; lateral margins in dorsal view distinctly diverging posteriad; between anterior angles and scutellum without distinct impressions; punctation extremely fine, visible only at high magnification; pubescence similar to that in *C. vestita*. Scutellum impunctate. Hind wings reduced. Legs shorter than in *C. vestita*.

Abdomen with rather dense and coarse, somewhat granulose punctation; anterior transverse impressions of tergites III-V with approximately 11 short carinae; tergite VII with weakly pronounced palisade fringe; tergite VIII without median carina, fringes of dense thin pubescence not confined to posterior margin, but extensive and present also in posterior $^1/_4$ to $^1/_3$ of tergal surface.

♂: Aedeagus as illustrated by PACE (1991).

♀: Spermatheca as illustrated by PACE (1991).

Comparative notes: *C. smetanai* is at once distinguished from the similar *C. vestita* by the much shorter antennae with much more transverse preapical antennomeres, by the wedge-shape head, smaller eyes, more pronounced median sulcus of the pronotum, more distinct pronotal punctation, by the distinctly shorter elytra with less pronounced anterior angles and posteriad diverging lateral margins, the more pronounced and denser punctation of the abdomen, the distinctly greater number of short carinae in the anterior transverse impressions of the abdominal terga III-V, and by the sexual characters. From all other Himalayan congeners, *C. smetanai* is distinguished especially the short elytra and the primary sexual characters.

Distribution: The species is known only from the type locality in eastern Nepal.

2.3. *Cordalia permutata* **n. sp.** (Figs. 4–8)

Cordalia vestita: PACE (1991).

Holotype ♂: Nepal, Rasuwa Distr., above Bokhajhundo, 1950 m, 11.IV.1985, A. SMETANA / "Holotypus ♂ *Cordalia permutata* sp. n. det. V. ASSING 2001" (MHNG).

Paratypes: **Nepal:** 1♂, 1♀: Same data as holotype; – ♂: Nepal, Kathmandu, Godwari, 1600 m, 31.III.1984, LÖBL (MHNG); – 1♀: Nepal, Annapurna Mts., Bhickok-Deurali, 2100 m, 7.V. 1999, KRÜGER & HIRTHE (cHir); – 4♂♂: Nepal, Himalaya, 20 km W Pokhara, Mt. Panchase / 2300 m, Waldbodengesiebe, 20.V. 1997, O. JÄGER (SMTD, cAss); – 17♂♂, 17♀♀: Nepal, Lalitpur Distr., Phulcoki, 2650 m, 13.X. 1983, SMETANA & LÖBL / *Cordalia vestita* (Boh.), det. R. PACE 1987 (MHNG, cAss); – 1♂, 2♀♀: Nepal, Lalitpur Distr., Phulcoki, 2550 m, 15.X.1983, SMETANA & LÖBL / *Cordalia vestita* (Boh.), det. R. PACE 1987 (MHNG, cAss); – 2♂♂, 7♀♀: Nepal, Lalitpur Distr., Phulcoki, 2700 m, 16. X. 1983, SMETANA & LÖBL / *Cordalia vestita* (Boh.), det. R. PACE 1987 (MHNG, cAss); – 2♂♂: Nepal, Lalitpur Distr., Phulcoki N-slope, 2600 m, 16.X. 1983, SMETANA & LÖBL / *Cordalia vestita* (Boh.), det. R. PACE 1987 (MHNG); – 1♂, 7♀♀: Nepal (Prov. Bagmati), Phulchauki nr. Kathmandu, 2300 m, 10.V. 1981, I. LÖBL / *Cordalia vestita* (Boh.), det. R. PACE 1987 (MHNG); – 15♂♂, 25♀♀: Nepal, Kathmandu Distr. / Phulcoki, 2600 m, 20.IV. 1982, A. & Z. SMETANA / *Cordalia vestita* (Boh.), det. R. PACE 1987 (MHNG, cAss); – 14♂♂, 11♀♀: Nepal, Kathmandu Distr. / Phulcoki, 2650 m, 21.IV. 1982, A. & Z. SMETANA / *Cordalia vestita* (Boh.), det. R. PACE 1987 (MHNG, cAss); – 2♂♂: Same data, but 2550 m (MHNG); – 1♂: Nepal, Rasuwa Distr., Langtang Khola Valley, Forest Camp, 1950 m, 13.IV. 1985, A. SMETANA (cAss); – 1♀: 564 Nepal: Dailekh Distr., Dailekh to Mabuchin Pass, 2300 m, 3.–4.VI. 1998, W. SCHAWALLER (SMNS).

China: 1♂: China: Border Shaanxi–Sichuan (Daba Shan), pass 20 km SSE Zhenping,

1700–800 m, 31°44'N, 109°35'E, 9.VII. 2001, M. SCHÜLKE [C01–07] / young dry mixed forest, field edge, small creek valley, moss (sifted) [C01–07] (cAss).
Taiwan: 18♂♂, 18♀♀: Taiwan, Pingtung Hsien, Peitawushan trail at 1500 m [T110], 1.V. 1992, A. SMETANA (MHNG, cAss, cSch); – 1♂: Taiwan, Pingtung Hsien, Peitawushan, Kual-Ku Hut, 2325 m, 23.V. 1991, A. SMETANA (MHNG); – 5♂♂, 7♀♀: Taiwan, Pingtung Hsien, Peitawushan Trail at 2000 m, 23.V. 1991, A. SMETANA (MHNG); – 1♀: Taiwan, Nantou Hsien, Shanlinchi, 1650 m, 19.V. 1991, A. SMETANA (MHNG); – 5♂♂, 4♀♀, Taiwan, Taoyuan Hsien, Takuanshan For. [forest], 1650 m, 17.IV. 1990, A. SMETANA [T5] (MHNG, cAss).

Etymology: The name (Latin, adjective) refers to the fact that the species was previously sometimes confused with *C. vestita*.

Description: Total length 3.0–3.8 mm. Usual coloration: head blackish brown; pronotum, elytra, and abdomen light brown to brown, mostly with abdominal segments VI and VII slightly infuscate; antennae ferrugineous or brown; legs testaceous.

Head 1.1–1.2 times as wide as long (length measured from anterior margin of clypeus); posterior angles broadly rounded, usually weakly marked; eyes large, temples approximately as long as eyes or slightly shorter; integument without microsculpture and with extremely fine, barely noticeable punctation; pubescence predominantly erect and relatively long.

Pronotum 1.10–1.15 times as wide as pronotum; posterior margin moderately convex (less so than in *C. vestita*); punctation very fine, much denser and sometimes more distinct than that of head; pubescence long and erect; median sulcus narrow and distinct; posterior median area of pronotum not flattened.

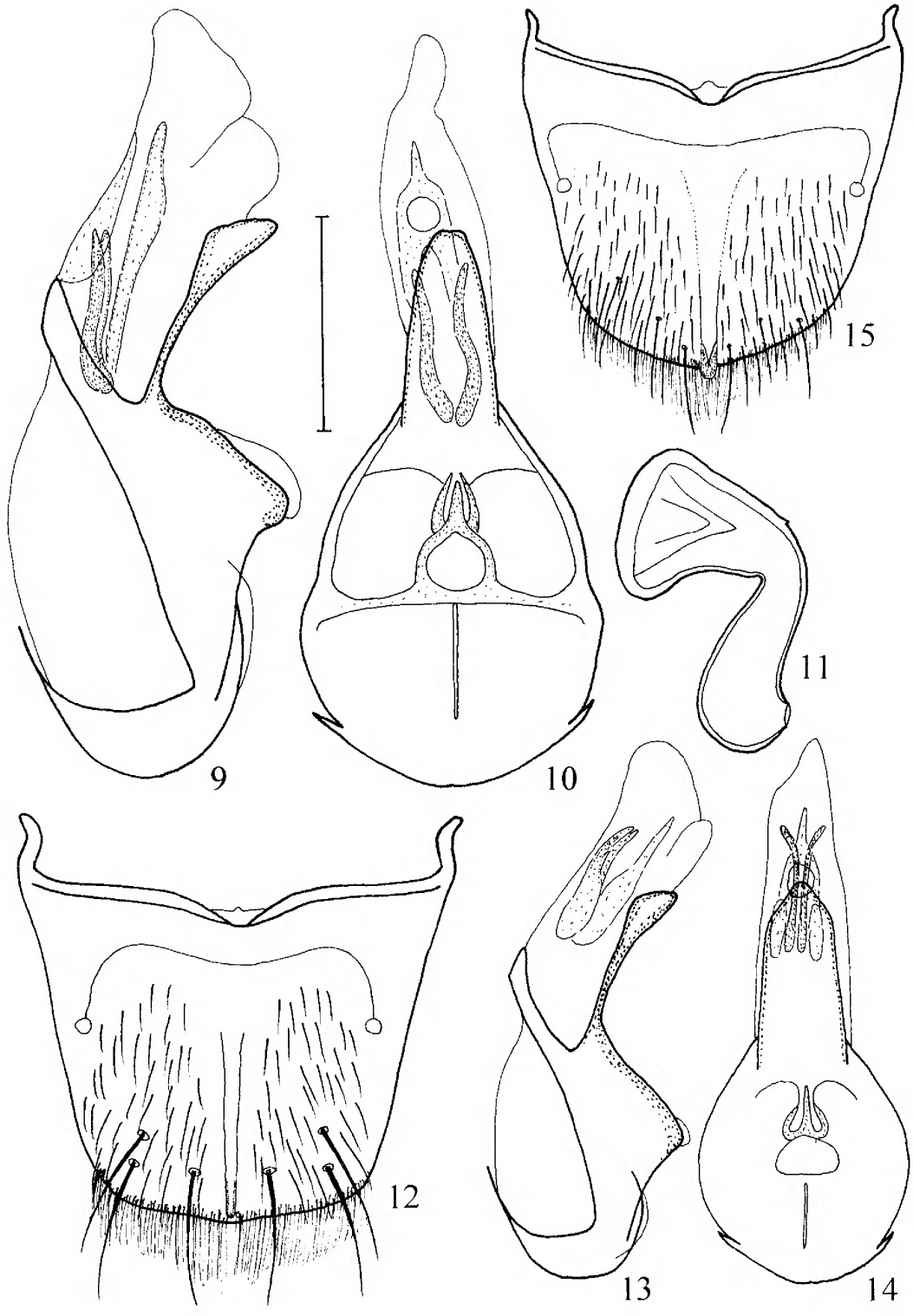
Elytra approximately 1.4–1.5 times as wide as pronotum and at suture only indistinctly shorter than pronotum; between anterior angles and scutellum with moderately deep impression; punctation and pubescence usually similar to that of pronotum. Scutellum impunctate. Hind wings fully developed. Tarsi relatively slender; metatarsi 0.75–0.80 times the length of metatibiae; first metatarsomere approximately as long as the three following tarsomeres.

Abdomen with punctation of rather variable density, but always more distinct than that of forebody; anterior transverse impressions of tergites III-V with on average 9 short carinae; tergite VII with palisade fringe; tergite VIII weakly transverse and with median carinae not or only weakly projecting beyond posterior margin, fringes of dense thin pubescence confined to posterior margin (Fig. 8).

♂: Head with extensive impression, this impression usually sulcate in the middle; pronotum along median line broadly impressed, depth and width of this impression subject to some intraspecific variation; sternite VIII posteriorly weakly convex; aedeagus with ventral process of median lobe apically very acute both in ventral and in lateral view (Figs. 4–5).

♀: Head and pronotum without such impressions; sternite VIII posteriorly weakly concave to truncate; spermatheca as in Figs. 6–7.

Comparative notes: From *C. vestita*, this species is readily distinguished by larger size, darker coloration, smaller eyes, the different morphology and chaetotaxy of the abdominal tergum VIII, and by the primary sexual characters. It is separated from other Himalayan congeners especially by the primary sexual characters. In the much smaller (according to the original description 1.9–2.0 mm) *C. orousseti* Pace from Nepal, the ventral process of the median lobe of the aedeagus is of somewhat similar shape, but it is apically even longer and more slender, the crista apicalis is



Figs. 9–15. *Cordalia longicornis* Cameron (9–12) and *C. schawalleri* n. sp. (13–15). – 9–10. Median lobe of aedeagus in lateral and in ventral view; – 11. spermatheca; – 12. tergite VIII; – 13–14. median lobe of aedeagus in lateral and in ventral view; – 15. tergite VIII. – Scale bar: 0.2 mm.

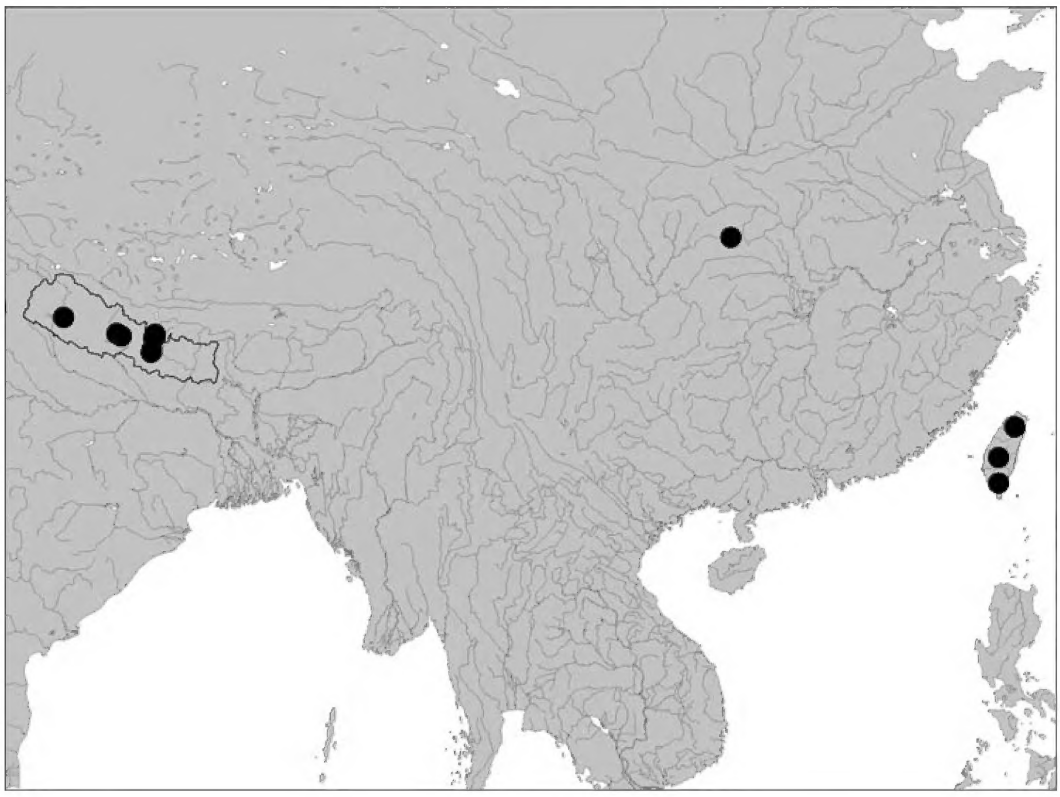


Fig. 16. Distribution of *Cordalia permutata* n. sp. The border of Nepal is highlighted to facilitate geographic recognition.

more strongly reduced and of different shape, the crista proximalis is not prominent, and the spermatheca is of different morphology. For illustrations of the genitalia of *C. orousseti* see the figures in PACE (1991). For additional characters see the comparative notes below the following species.

Distribution and bionomics: The fact that *C. permutata* n. sp. occurs in Nepal, China, and in Taiwan (Fig. 16) suggests that this species is widespread in the Eastern Palaearctic region. It has been collected at altitudes of 1500–2700 m. One dissected female taken in April had a mature egg in the ovaries.

2.4. *Cordalia longicornis* Cameron, 1939 (Figs. 9–12)

Cordalia longicornis Cameron (CAMERON 1939: 238).

Type material examined: Holotype ♂: "Ghum district, v-vi-31, Dr. Cameron / Cordalia longicornis Cam. TYPE / TYPE / M. Cameron Coll. B.M. 1936–555" (BMNH).

Additional material examined: **India:** 1♀, Ghum Distr. Lepchajagat, V.–VI. 1931, CAMERON (BMNH). – **Nepal:** 5♂♂, 5♀♀, Panchthar Distr., Paniporua, 16.–20.IV. 1988, 2300 m, W. SCHAWALLER (SMNS, cAss).

Redescription: Size, coloration, proportions, punctation, pubescence, and other external characters as in *C. permutata*, but distinguished as follows:

Pubescence of anterior part of the body somewhat denser; abdomen with denser punctation than in average specimens of *C. permutata*.

Median carina of tergite VIII often projecting over posterior margin and forming a distinct and acute process (Fig. 12).

♂: Impression on head less pronounced or even indistinct, not distinctly sulcate in the middle; pronotum on either side of median sulcus more or less flattened; aedeagus with ventral process of median lobe apically shorter and less acute in lateral view and apically rounded or truncate in ventral view (Figs. 9–10).

♀: Spermatheca with apical cuticular intrusion distally broader and proximally more acute, duct shorter and proximally more strongly dilated (Fig. 11).

Comparative notes: Though highly similar to *C. permutata* in external appearance, *C. longicornis* is readily distinguished from that species – as well as from other Himalayan representatives of the genus – by the morphology of the primary sexual characters.

Distribution and bionomics: *C. longicornis* is currently known from the Ghum District (West Bengal, India) and from the very east of Nepal.

2.5. *Cordalia schawalleri* n. sp. (Figs. 13–15)

Holotype ♂: Nepal: 412 Dist. Sankhua Sabha, Arun Valley, between Mure and Hurure, 9.–17. VI. 1988, 2050–2150 m, W. SCHAWALLER / "Holotypus *Cordalia schawalleri* sp. n. det. V. ASSING 2001" (SMNS).

Etymology: The species is dedicated to WOLFGANG SCHAWALLER (SMNS), who collected the holotype.

Description: Length 2.9 mm. In external appearance similar to *C. vestita*, but distinguished as follows:

Eyes smaller, slightly shorter than temples in dorsal view; pronotal sulcus distinctly wider and broader, its posterior end closer to posterior margin; posterior lateral areas of pronotum (near posterior end of sulcus) with 5–10 large punctures or puncture-like grooves; posterior median area of pronotum not impressed or flattened; posterior margin of pronotum weakly convex.

Elytra between anterior angles and scutellum without distinct impressions. Scutellum densely punctate.

Abdomen with conspicuously dense and slightly granulose punctation; transverse impressions of tergites III-V with 11 short carinae; tergite VIII with median keel and with fringes of long thin pubescence confined to posterior margin (Fig. 15).

♂: Head without impression; pronotum on either side of sulcus neither flattened nor distinctly impressed; posterior margin of sternite VIII convex; aedeagus with ventral process of median lobe apically relatively short and blunt; crista apicalis reduced; sclerotized internal structures relatively short (Figs. 13–14).

♀: Unknown.

Comparative notes: Among its Himalayan congeners, *C. schawalleri* n. sp. is characterised by the dense punctation of the scutellum and the abdomen, the pronounced pronotal sulcus, the puncture-like grooves in the posterior lateral area of the pronotum, the absence of distinct impressions between the anterior angles of the elytra and the scutellum, the greater number of carinae in the anterior impressions of tergites III-V, and by the morphology of the aedeagus.

Distribution and bionomics: *C. schawalleri* n. sp. is currently known only

from the type locality in eastern Nepal, where it was collected at an altitude of little more than 2000 m. Its fully developed wings and the relatively low altitude of the type locality suggest that the species may be more widespread.

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